

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today
(1) was not written for publication in a law journal and
(2) is not binding precedent of the Board.

Paper No. 24

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte THOMAS S. HICKERNELL

Appeal No. 1998-0437
Application 08/603,523

ON BRIEF

Before THOMAS, HAIRSTON, and GROSS, Administrative Patent Judges.

HAIRSTON, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 1-13 and 15-20. In an Amendment After Final (paper number 7), claims 5, 7, 11, and 17 were canceled, and claims 8, 12, and 18 were amended. In a previous amendment (paper number 5), claim 14 was canceled. Accordingly, claims 1-4, 6, 8-10, 12,

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13, 15, 16, and 18-20 remain on appeal.

The disclosed invention relates to a device and a method of producing an acoustic wave device that comprises a substrate, a transducer disposed on the substrate, and reflectors disposed at first and second acoustic ports of the transducer. Each of the reflectors includes a number N_g of reflection elements, and the number N_g is chosen in accordance with $(2\mathbf{B}/3)(2\mathbf{B}^2 + 8k^2 - 2\mathbf{B}(\mathbf{B}^2 + 8k^2)^{0.5} - (k^2/3)^2)^{-0.5} \# N_g \# (4\mathbf{B}/3)(2\mathbf{B}^2 + 8k^2 - 2\mathbf{B}(\mathbf{B}^2 + 8k^2)^{0.5} - (2k^2/3)^2)^{-0.5}$ wherein k^2 is an electromechanical coupling coefficient of the substrate.

Claim 1 is illustrative of the claimed subject matter and is reproduced below:

1. An acoustic wave device comprising:
a substrate for supporting acoustic wave propagation;
a transducer disposed on said substrate, said transducer for converting electrical energy to acoustic energy and vice versa; and
a first reflector disposed at a first acoustic port of said transducer, wherein said first reflector includes a first number of reflection elements, wherein said first number includes a first number N_{g1} of reflection elements, said first number N_{g1} chosen in accordance with $(2\mathbf{B}/3)(2\mathbf{B}^2 + 8k^2 - 2\mathbf{B}(\mathbf{B}^2 + 8k^2)^{0.5} - (k^2/3)^2)^{-0.5} \# N_{g1} \# (4\mathbf{B}/3)(2\mathbf{B}^2 + 8k^2 - 2\mathbf{B}(\mathbf{B}^2 + 8k^2)^{0.5} - (2k^2/3)^2)^{-0.5}$, wherein k^2 is an electromechanical coupling coefficient of said substrate.

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The examiner relies on the following reference:¹

Satoh et al. (Satoh) 5,559,481 Sept. 24,
1996
(filed Oct. 23,
1992)

Claim 13 stands rejected under the second paragraph of U.S.C. § 112 as being indefinite.

Claims 1-4, 6, 8-10, 12, 13, 15, 16, and 18-20 stand finally rejected under 35 U.S.C. § 102(e) as being anticipated by Satoh.

Reference is made to the briefs and the answer for the respective positions of the appellant and the examiner.

¹The following references are cited as of interest for their teachings of a surface acoustic wave transducer having LiNbO₃ and LiTaO₃ substrates:

Hickernell, "The Dependencies of SAW-Transducer Equivalent-Circuit-Model Parameters On Transducer Geometry," IEEE Ultrasonics Symposium, 127-30 (1997).

Hickernell et al., (Hickernell), "The Surface Acoustic Wave Propagation Characteristics of 41E Lithium Niobate with Thin-Film SiO₂," IEEE International Frequency Control Symposium, 216-221 (1996).

Hickernell et al., (Hickernell), "The Surface Acoustic Wave Propagation Characteristics of 64E Y-X LiNbO₃ and 36 E Y-X LiTaO₃ Substrates with Thin-Film SiO₂," IEEE Ultrasonics Symposium, 345-48 (1995).

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OPINION

The rejection is affirmed-in-part. The rejection of claims 10, 12, 13, and 15 is reversed. The rejection of claims 1-4, 6, 8, 9, 16, and 18-20 is affirmed.

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According to the examiner (Answer, page 4), claim 13 is indefinite because it depends from canceled claim 11. Appellant corrected the error (Corrected Reply Brief, pages 1 and 2). The correction was approved by the examiner (PTOL-90, mailed July 16, 1998). Thus, the rejection under 35 U.S.C. § 112, second paragraph is reversed.

According to the examiner (Answer, page 5), Satoh discloses (Figs. 44 and 45; and column 19, lines 11, 12, and 19) all of the device and steps of claims 1-4, 6, 8-10, 12, 13, 15, 16, and 18-20. The examiner states (Answer, page 6) that Satoh discloses a number of reflection elements ($N_{g1}=50$) for a LiTaO_3 substrate having a coupling coefficient $k^2 = 0.05$ (Satoh, column 16, lines 38-40; column 19, line 19). The examiner also states (Answer, page 6) that substituting $k^2=0.5$ into the claimed equation yields a range of $34 \leq N_{g1} \leq 78$ for the chosen number of reflective elements N_{g1} . The examiner concludes (Answer, page 6) that $N_{g1}=50$ is within the range specified by the equation in the claimed invention.² The examiner further

²Titanium Metals Corp. v. Banner, 778 F.2d 775, 782, 227 USPQ 773, 779 (Fed. Cir. 1985) (citing In re Petering,

concludes (Answer, page 6) that the substrate and finger count (i.e., number of reflective elements) of Satoh satisfies the conditions of the claimed equation in spite of the broader ranges in the disclosure. With respect to the device claims, we agree with the examiner that the Satoh product (i.e., the acoustic wave device) is the same as the claimed product because $N_{g1}=50$ is within the range that results from the claimed equation. When claims are directed to a "product-by-process," it is the patentability of the product claimed and not of the recited process which must be established. In re Brown, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972); In re Thorpe, 777 F.2d 695, 697, 227 USPQ 964, 966 (Fed. Cir. 1985).

It is our view that the examiner's rejection of the instant product-by-process claims over the device of Satoh was appropriate given that the product of Satoh appears to be identical, albeit produced by a different process, to the product claimed by the appellant. Such a rejection shifts the

301 F.2d 676, 682, 133 USPQ 275, 280 (CCPA 1962)); Manual of Patent Examining Procedure (MPEP) § 2131.03 (7th ed., July 1998).

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burden upon appellant to come forward with evidence establishing a difference between the claimed product and the prior art product. In re Marosi, 710 F.2d 799, 803, 218 USPQ 289, 292-93 (Fed. Cir. 1983). We hold that appellant has not presented sufficient evidence to establish a difference between the claimed product and the prior art product. Thus, we disagree with appellant's argument (Brief, page 5) that Satoh does not teach that the first number N_g is chosen in accordance with $(2B/3)(2B^2 + 8k^2 - 2B(B^2 + 8k^2)^{0.5} - (k^2/3)^2)^{-0.5} \# N_{g1} \# (4B/3)(2B^2 + 8k^2 - 2B(B^2 + 8k^2)^{0.5} - ((2k^2/3)^2)^{-0.5}$, wherein k^2 is an electromechanical coupling coefficient of said substrate defined in claims 1-4, 6, 8, 9, 16, and 18-20.

Appellant further argues (Brief, page 6) that Satoh is a non-enabling reference. Mere attorney argument (Brief, pages 6-13) will not suffice to prove non-enablement of Satoh. Evidence of such non-enablement must be provided by appellant to prove such a case.⁴

⁴Appellant's citation of In re Brown, 329 F.2d 1006, 141 USPQ 245 (CCPA 1964) and In re LeGrice, 301 F.2d 929, 133 USPQ 365 (CCPA 1962) cannot take the place of an evidentiary showing.

Appellant argues (Brief, page 12) that Satoh only teaches a fixed number of reflective elements. We agree. As indicated supra, the products are still the same.

Appellant also argues (Brief, page 12) that Satoh is silent with respect to the thickness of metallization. Appellant acknowledges (Brief, page 13) that Satoh discloses material thickness. Furthermore, the claimed invention does not specifically claim thickness of metallization. Therefore, appellant's argument concerning thickness is not persuasive.

We note that the coupling coefficient is the only variable term that must be supplied in appellant's claims on appeal. Appellant's coupling coefficient of the substrate material (Specification, pages 7 and 8) is "tabulated in a variety of textbooks related to piezoelectric materials." Satoh discloses a coupling coefficient of a substrate material and material thickness (column 14, lines 6-14).

Appellant additionally argues (Brief, page 13) that Satoh teaches away from the limitations of appellant's claims. Specifically, appellant argues that Satoh teaches only a fixed number of reflection elements. The examiner responds (Answer, page 6) that simply because the claims encompass a broader

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range of substrates and finger numbers than Satoh does not mean that those chosen by Satoh fail to render the claims as being anticipated. We agree. Appellant's argument overlooks the fact that the fixed number in Satoh is within the disclosed and claimed range.

Lastly, appellant argues (Brief, page 13) that Satoh's invention would yield fewer than 50 reflective elements. Appellant has not stated that this value of N_{g1} would still not be within the range ($34 \leq N_{g1} \leq 78$) of appellant's invention as calculated by the examiner (Answer, page 6). Therefore, with respect to the device claims, we agree with the examiner's rationale for rejecting the claims.

In summary, the rejection of apparatus claims 1-4, 6, 8, 9, 16, and 18-20 is sustained. The rejection of method claims 10, 12, 13, and 15 is reversed because the examiner has not made a showing that the method steps of these claims read on Satoh.

DECISION

The decision of the examiner rejecting claim 13 under the second paragraph of 35 U.S.C. § 112 is reversed. The decision of the examiner rejecting apparatus claims 1-4, 6, 8, 9, 16,

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and

18-20 under 35 U.S.C. § 102(e) is affirmed. The decision of the examiner rejecting method claims 10, 12, 13, and 15 under 35 U.S.C. § 102(e) is reversed.

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No time period for taking any subsequent action in
connection with this appeal may be extended under 37 CFR
§ 1.136(a).

AFFIRMED-IN-PART

JAMES D. THOMAS)	
Administrative Patent Judge)	
)	
)	
)	BOARD OF PATENT
KENNETH W. HAIRSTON)	APPEALS AND
Administrative Patent Judge)	INTERFERENCES
)	
)	
ANITA PELLMAN GROSS)	
Administrative Patent Judge)	

KWH:CR/hh

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